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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,131	01/12/2005	Giuseppe Pasqualini	IT 020018	6805

24737 7590 08/19/2008
PHILIPS INTELLECTUAL PROPERTY & STANDARDS
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EXAMINER	
MARTELLO, EDWARD	

ART UNIT	PAPER NUMBER
2628	

MAIL DATE	DELIVERY MODE
08/19/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/521,131	PASQUALINI ET AL.	
	Examiner	**Art Unit**	
	Edward Martello	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _08 April 2008_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-20_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-20_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is responsive to the claim amendments received 04/08/2008 which are entered into the record. Currently, claims 1-11 are amended, claim 12 is as originally presented and claims 13-20 are newly added, thus resulting in claims 1-20 currently pending in the application.

2. The amendment to the specification, received 04/08/2008, to correct the minor error in the paragraph beginning at page 7, line 12, is accepted and entered into the record.

Claim Rejections

3. The amendments to the previously presented claims, plus the addition of eight new claims, have necessitated the modification of the original grounds of rejection of the first presented claims and the inclusion of additional rejections to the eight new claims that follow. The following rejections are based solely upon previously cited art used for the claim rejections presented in first Office Action on the merits.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 4, 6-8 and 12-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Bachmann et al. (U.S. Patent 5,436,673, hereafter '673).

5. Regarding claim 1 (Currently amended), Bachmann teaches a method of non-linear processing ('673; figs. 1 and 3A-3D; col. 3, ln. 54-60; col. 5, ln. 26-31 – where the curve

changes slope – non-linear) of at least one set of~~ input~~ luminance, saturation, and hue parameter values (‘673; fig. 1, inputs converted, as necessary, to hue, sat and Y - luminance) ~~(Y,S,H)~~ of input picture signals~~ (R,G,B,)~~ so as to produce output picture signals~~ (R',G',B')~~, (‘673; fig. 1; col. 2, ln. 62-68, col. 3, ln. 1-6), with output based on the hue parameter value and modified luminance and saturation parameter values (‘673; fig. 1)~~ (Y', S', H'), characterized in that~~ wherein the non-linear processing (‘673; figs. 1 and 3A-3D; col. 3, ln. 54-60; col. 5, ln. 26-31 – where the curve changes slope – non-linear) is responsive to the hue parameter values (‘673; figs. 1 and 3A-3D; col. 3, ln. 54-60)~~ (H)~~ of the input picture signals ~~(R,G,B)~~ (‘673; fig. 1). Bachmann discloses three separate correction units, all of which receive the hue signal as an input, to allow correction of any or all of the luminance, saturation or hue signals by look-up tables containing, programmable, non-linear correction functions.

6. In regards to claim 2 (Currently amended), Bachmann teaches ~~A method as claimed in~~ the method of claim 1, and further teaches wherein the non-linear processing~~ involves the steps of~~ includes determining a power (any desired function; ‘673; col. 4, ln. 29-33) ~~γ_h~~ depending on the hue parameter values (‘673; fig. 1; col. 1, ln. 14-19)~~ (H)~~, and raising ~~a~~ the saturation~~ related input~~ parameter values ~~S~~ to the power (any desired function; ‘673; col. 4, ln. 29-33) ~~γ_h~~ (SAT*KORR.SAT, ‘673; fig. 1, functional block 17).

7. Regarding claim 4 (Currently amended), Bachmann teaches ~~A method as claimed in~~ the method of claim 1, and further teaches wherein the non-linear processing ~~involves the steps of~~ includes determining a power (any desired function; ‘673; col. 4, ln. 29-33) ~~γ_y~~ depending on the hue parameter values~~ (H)~~, and raising ~~a brightness-related input~~ the luminance parameter values

~~(Y)~~ to the power (any desired function; ‘673; col. 4, ln. 29-33) ~~γ_y~~ (Y*KORR.LUM, ‘673; fig. 1, functional block 18).

8. In regards to claim 6 (Currently amended), Bachmann teaches ~~A method as claimed in~~ the method of claim 2, and further teaches wherein the non-linear processing of the saturation ~~related input~~ parameter values ~~S~~ depends on maximum saturation values ~~S_{max}~~ (S.SAT – max value from fig. 8) (‘673; col. 6, ln. 62-68, col. 7, ln. 1-12).

9. Regarding claim 7 (Currently amended), Bachmann teaches ~~A method as claimed in~~ the method of claim 6, and further teaches wherein the maximum saturation values ~~S_{max}~~ (S.SAT – max value from fig. 8) depend on the hue parameter values ~~(H)~~ (‘673; col 2, ln. 62-68).

10. In regards to claim 8 (Currently amended), Bachmann teaches ~~A method as claimed in~~ the method of claim 6, and further teaches wherein the maximum saturation values (W.SAT – waveform of fig. 8 verses Y) ~~S_{max}~~ depend on ~~a brightness related output~~ the modified luminance parameter value (‘673; fig. 7 and 8; output of functional block 44 applied to multiplier functional block 48; ‘673; fig. 1; col 6, ln. 62-68, col. 7, ln. 1-12) ~~(Y’)~~.

11. In regards to claim 12 (Original), Bachmann teaches an apparatus comprising picture processing circuitry for carrying out the method as claimed in claim 1 (‘673; fig.1 & 2, col.1, ln.56-62; col. 4, ln. 49-65).

12. Regarding claim 13 (New), Bachmann teaches a method comprising: receiving input picture signal values, determining hue, saturation, and luminance values based on the input signal values (‘673’ fig. 1; col. 2, ln. 58-61), processing the saturation and luminance values using one or more exponential (any desired function; ‘673; col. 4, ln. 29-33) processes based on the hue values (‘673; figs. 1 and 3A-3D; col. 3, ln. 54-60; col. 5, ln. 26-31 – where the curve

changes slope; non-linear) to provide at least one of modified saturation (SAT*KORR.SAT, '673; fig. 1 functional block 17) values and modified luminance values (Y*KORR.LUM, '673; fig. 1 functional block 18), and determining output picture signal values based at least in part on the at least one modified saturation and modified luminance values ('673; fig. 1; col. 2, ln. 62-68, col. 3, ln. 1-6).

13. In regards to claim 14 (New), Bachmann further teaches, wherein the exponential (any desired function; '673; col. 4, ln. 29-33) process includes determining a power (any desired function; '673; col. 4, ln. 29-33) based on the hue value and raising at least one of the saturation (SAT*KORR.SAT, '673; fig. 1 functional block 17) and luminance values (Y*KORR.LUM, '673; fig. 1 functional block 18) to the power (any desired function; '673; col. 4, ln. 29-33).

14. Regarding claim 15 (New), Bachmann further teaches wherein determining the power (any desired function; '673; col. 4, ln. 29-33) is based at least in part on hue values of prior input picture signal values ('673; fig. 1, computer manages two sets of correction values). Bachmann provides two sets of look-up table (LUT) RAM for storing correction values for each of the hue, saturation, and luminance input values; one table is for used for storing old or previous corrections and is addressed or pointed to by input HUE values and the second is used for updating to new or different sets of correction factors based on manual setting changes, computer determined changes to the values or the like. The computer determined switching is synchronized with the start of each frame ('673; col. 3, ln. 54-68, col. 4, ln. 1-22).

15. In regards to claim 16 (New), Bachmann further teaches wherein the one or more exponential (any desired function; '673; col. 4, ln. 29-33) processes are based at least in part on hue values of prior input picture signal values ('673; col. 3, ln. 17-46). Bachmann provides two

sets of look-up table (LUT) RAM for storing correction values for each of the hue, saturation, and luminance input values; one table is for used for storing old or previous corrections and is addressed or pointed to by input HUE values and the second is used for updating to new or different sets of correction factors based on manual setting changes, computer determined changes to the values or the like. The computer determined switching is synchronized with the start of each frame ('673; col. 3, ln. 54-68, col. 4, ln. 1-22).

16. Regarding claim 17 (New), Bachmann teaches the method of claim 13 and further teaches wherein the modified saturation values are based on maximum saturation values (S.SAT – max value from fig. 8) ('673; col. 6, ln. 62-68, col. 7, ln. 1-12).

17. In regards to claim 18 (New), Bachmann further teaches wherein the maximum saturation values are based on the modified luminance values ('673; fig. 1, 6A and 7; col. 6, ln. 35-68, col. 7, ln. 1-12).

18. Regarding claim 19 (New), Bachmann teaches a system ('673; fig. 2) comprising: a source of (conversion means to provide) luminance, saturation, and hue values ('673; fig. 1), and one or more exponential (any desired function; '673; col. 4, ln. 29-33) function blocks that are configured to provide at least one of a modified luminance value (Y*KORR.LUM, '673; fig. 1 functional block 18) and a modified saturation value (SAT*KORR.SAT, '673; fig. 1 functional block 17) based on the hue value ('673; fig. 1; col. 1, ln. 14-19).

19. In regards to claim 20 (New), Bachmann further teaches the system includes a controller that is configured to provide a power (any desired function; '673; col. 4, ln. 29-33) based at least in part on the hue value and prior hue values to the exponential function (any desired function; '673; col. 4, ln. 29-33) block ('673; fig. 1, col. 3, ln. 54-68, col. 4, ln. 1-22 , and the exponential

function (any desired function; ‘673; col. 4, ln. 29-33) block is configured to raise one of the luminance (Y*KORR.LUM, ‘673; fig. 1, functional block 18) and saturation values to that power (SAT*KORR.SAT, ‘673; fig. 1, functional block 17). Bachmann provides two sets of look-up table (LUT) RAM for storing correction values for each of the hue, saturation, and luminance input values; one table is for used for storing old or previous corrections and is addressed or pointed to by input HUE values and the second is used for updating to new or different sets of correction factors based on manual setting changes, computer determined changes to the values or the like. The computer determined switching is synchronized with the start of each frame (‘673; col. 3, ln. 54-68, col. 4, ln. 1-22).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

20. Claims 3, 5, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bachmann et al. (U.S. Patent 5,436,673, hereafter '673) as applied to claims 1, 2, 4, 6-8 and 12-20 above, and further in view of Udagawa et al. (U. S. Patent 4,731,662, hereafter '662).

21. Regarding claim 3 (Currently amended), Bachmann teaches ~~A method as claimed in~~ The method of claim 2, ~~further comprising the step of~~ but does not teach including adapting the power (any desired function; '673; col. 4, ln. 29-33) ~~γ_h~~ based on histogram data derived from one or more of the ~~input~~ parameter values ~~(Y,S,H)~~. However, Udagawa, working in the same field of endeavor, teaches a method comprising the step of adapting the power (saturation compression; '662, col.4, ln. 23-45) based on histogram data derived from the input parameter values ('662, col. 4, ln. 5) ('662; fig. 5; col.4, ln. 23-45) for the benefit of providing a method that is able to handle the condition where the density range of color saturation values of an input image signal is broader than the density range of a target output device so that the compression compensation is controlled in a manner to avoid the loss of picture detail because the histogram equalization allows the color saturation to be increased more for picture areas showing low saturation density levels than for picture areas showing high saturation density levels while preventing the overall corrected signal from exceeding the saturation limit or clipping level of the output device. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the teachings of Bachmann and the histogram teachings of '662 to provide a method to handle the condition where the density range of color saturation values of an input image signal is broader than the density range of a target output device so that the compression compensation is controlled in a manner to avoid the loss of picture detail because the histogram equalization allows the color saturation to be increased more for picture

areas showing low saturation density levels than for picture areas showing high saturation density levels while preventing the overall corrected signal from exceeding the saturation limit or clipping level of the output device.

22. Regarding claim 5 (Currently amended), Bachmann teaches ~~A method as claimed in~~ The method of claim 4, ~~further comprising the step of~~ but does not teach including adapting the power (any desired function; '673; col. 4, ln. 29-33) ~~γ_y~~ based on histogram data derived from one or more of the input parameter values ~~(Y,S,H)~~. However, Udagawa, working in the same field of endeavor, teaches a method comprising the step of adapting the power (luminance compression; '662, col.4, ln. 23-45) based on histogram data derived from the input parameter values ('662, col. 4, ln. 5) ('662; fig. 5; col.4, ln. 23-45) for the benefit of providing a method that is able to handle the condition where the density range of luminance values of an input image signal is broader than the density range of a target output device so that the compression compensation is controlled in a manner to avoid the loss of picture detail because the histogram equalization allows the luminance to be increased more for picture areas showing low luminance density levels than for picture areas showing high luminance density levels while preventing the overall corrected signal from exceeding the luminance saturation limit or clipping level of the output device. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the teachings of Bachmann and the histogram teachings of '662 to provide a method to handle the condition where the density range of luminance values of an input image signal is broader than the density range of a target output device so that the compression compensation is controlled in a manner to avoid the loss of picture detail because the histogram equalization allows the luminance to be increased more for picture areas showing

low luminance density levels than for picture areas showing high luminance density levels while preventing the overall corrected signal from exceeding the luminance saturation limit or clipping level of the output device.

23. In regards to claim 10 (Currently amended), Bachmann and Udagawa teach ~~A method as claimed in~~ the method of claim 3, and Udagawa further teaches wherein, for a predetermined hue parameter value ~~(H)~~, the power (any desired function; '673; col. 4, ln. 29-33) ~~γ_h~~ is adapted on the basis of a weighed[[-]] average saturation parameter value of the input picture signals, representing pixels in a window of an image ('662; fig. 5 & 6; col. 4, ln. 20-68) (Note that Udagawa uses the symbol C for saturation, '662; col. 3, ln. 64-68).

24. Regarding claim 11 (Currently amended), Bachmann and Udagawa teach ~~A method as claimed in~~ the method of claim 10, Udagawa further teaches wherein, for a predetermined hue parameter value ~~(H)~~, the power (any desired function; '673; col. 4, ln. 29-33) ~~γ_h~~ for a current window is adapted in dependence dependent on the histogram data of ~~the~~ a current ('662; fig. 5 & 6; col. 4, ln. 20-68) (Note that Udagawa uses the symbol C for saturation, '662; col. 3, ln. 64-68) but does not teach and/or a previous window. It would have been obvious to one of ordinary skill at the time of the invention to have made the design choice of implementing the storing of histograms of previous frames in the memories contained in either cited patent and making the decision to use the current histogram or the previously stored values for the benefit of preventing or smoothing over abrupt scene changes in the input video stream.

25. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over 'Bachmann et al. (U.S. Patent 5,436,673, hereafter '673), as applied to claims 1- 8 and 10-20 above, and further in view of Yamada et al. (U. S. Patent 5,742,296, hereafter '296).

26. Regarding claim 9 (Currently amended), Bachmann teaches ~~A method as claimed in~~ the method of claim 6, but does not teach wherein ~~a saturation-related output~~ the modified saturation parameter value ~~S'~~ is substantially determined by the equation:

$S' = S_{max} (S/ S_{max})^{\gamma h}$,

where S is the saturation parameter value, S_{max} is the maximum saturation value, and γ_h, is the power. (any desired function; '673; col. 4, ln. 29-33). Yamada, working in the same field of endeavor, however, teaches a method for the benefit of preventing over saturation of the S values in the corrected image, wherein a saturation-related output parameter value S' (γ_0) that is substantially determined by the equation: $S' = S_{max} * (S/ S_{max})^{\gamma h}$ $\{\gamma_0 = \gamma_1(1-(1- \gamma_p \backslash \gamma_t)**\gamma_t \gamma_i\}$ ('296; col. 6, ln. 63-67, col. 7, ln. 1-2) where all the gamma values (saturations) are normalized to the value of 1 so that the form of this equation becomes the form of the instant application. In addition, γ_t corresponds to S, γ_p corresponds to S_{max} and γ_1 is approximately equal to S_{max} ('296; col. 6, ln. 25-45).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the previous teachings Bachmann and to include the teachings of '296 to provide an additional method to handle the condition where the total range of color saturation values of an input image signal is broader than the input range of a target output device thus allowing the controlling of the saturation compensation in a manner that avoids the loss of color saturation because the equalization allows the color saturation to be increased more for picture areas showing low saturation levels than for picture areas showing high saturation levels while preventing the overall corrected signal from exceeding the saturation limit or clipping level of the output device.

Response to Arguments

Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edward Martello whose telephone number is (571) 270-1883. The examiner can normally be reached on M-F 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Xiao Wu can be reached on (571) 272-7761. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/EM/

Examiner, Art Unit 2628

/XIAO M. WU/

Supervisory Patent Examiner, Art Unit 2628